

## AUTHOR INDEX

- Acland, F. A.** Food Products, Beverages, Rubber, Tobacco and Miscellaneous Manufactures Based on Vegetable Products 1932 (book review), 488.
- Adams, T.** Outline of Town and City Planning (book review), 487.
- Allison, F. E.** Carbohydrate supply as a primary factor in legume symbiosis, 123-143.
- Alway, F. J., and Zetterberg, J. M.** Relative amounts of calcium carbonate and magnesium carbonate in some Minnesota subsoils, 9-14.
- Andrews, W. B.** Carbon dioxide production by mannite-treated soils as a means of determining crop response to fertilizers, 47-57.
- Arrington, L. B., and Shive, J. W.** Rates of absorption of ammonium and nitrate nitrogen from culture solutions by ten-day-old tomato seedlings at two pH levels, 431-435.
- Arrington, L. B., Wadleigh, C. H., and Shive, J. W.** Apparatus for the determination of carbon dioxide in culture solutions, 437-441.
- Baker, F. S.** Theory and Practice of Silviculture (book review), 482.
- Barnette, R. M., and Warner, J. D.** Response of chlorotic corn plants to the application of zinc sulfate to the soil, 145-159.
- Bergey, D. H.** Bergey's Manual of Determinative Bacteriology (book review), 481.
- Bortner, C. E.** Toxicity of manganese to Turkish tobacco in acid Kentucky soils, 15-33.
- Brown, L. A.** Study of phosphorus penetration and availability in soils, 277-287.
- Brown, P. E.** See **Walker, R. H.**
- Chamberlain, J. S.** Textbook of Organic Chemistry (book review), 479.
- Chapman, H. D.** Inorganic phosphate in green plant tissue as a measure of phosphate availability, 111-122.
- Conn, H. J. and Darrow, M. A.** Characteristics of certain bacteria belonging to the autochthonous microflora of soil, 95-110.
- Csiky, J. S.** See **Mattson, S.**
- Daniel, H. A.** See **Murphy, H. F.**
- Darrow, M. A.** See **Conn, H. J.**
- Day, C.** Economic Development in Modern Europe (book review), 486.
- Drosdoff, M.** Separation and identification of the mineral constituents of colloidal clays, 463-478.
- DuToit, M. S., and Perold, I. S.** Factors which influence the use of the conductivity of soil suspensions as a measure of fertility, 59-74.
- Eldridge, E. F., and Theroux, F. R.** Laboratory Manual for the Chemical Analysis of Water and Sewage (book review), 480.
- Fraas, G. S., and Sterges, A. J.** Effect of sunlight on the nitrification of ammonium salts in soils, 85-94.
- Gilbert, B. E., and Pember, F. R.** Tolerance of certain weeds and grasses to toxic aluminum, 425-429.
- Greene, R. A.** Studies on protein synthesis by the genus *Azotobacter*, 327-336.
- Gripenberg, S.** Study of the Sediments of the North Baltic and Adjoining Seas (book review), 483.
- Hester, J. B.** Amphoteric nature of three coastal plain soils: I. In relation to plant growth, 237-245; II. In relation to the leaching and absorption of soil constituents by plants, 247-254; see **Mattson, S.**
- Hibbard, P. L.** Factors influencing phosphate fixation in soils, 337-358.
- Hopkins, E. W.** Effect of long and short day and shading on nodule development and composition of the soybean, 297-321.
- James, R. L.** Simpler method of expressing the mechanical analysis of many common soils, 271-275.
- Jenny, H., and Smith, G. D.** Colloidal chemical aspects of clay pan formation in soil profiles, 377-389.
- Jessness, O. B., Nowell, R. I., et al.** Program for Land Use in Northern Minnesota (book review), 484.
- Joffe, J. S.** Soil profile studies: VII. The glei process, 391-401.
- Kipping, F. B.** See **Kipping, S.**

- Kipping, S.**, and Kipping, F. B. Perkin and Kipping's Organic Chemistry, part III (book review), 479.
- Koch, F. C.** Practical Methods in Biochemistry (book review), 480.
- Kühn, S.** Note on the relation between lime content and pH values of soils, 167-169.
- Löddesöl, A.** New instrument for soil sampling, 257-261.
- McGeorge, W. T.** Relation of potential alkalinity to the availability of phosphate in calcareous soils, 443-452.
- MacIntire, W. H.** See **Shaw, W. M.**
- Mattson, S.**, and Csiky, J. S. Laws of soil colloidal behavior: XVI. The cation exchange-maximum in aluminosilicates, 161-165.
- Mattson, S.**, and Hester, J. B. Laws of soil colloidal behavior: XV. The degradation and the regeneration of the soil complex, 75-84.
- Morrison, N. F.** Commercial and Economic Geography (book review), 484.
- Morse, H. H.** Toxic influence of fluorine in phosphatic fertilizers on the germination of corn, 177-195.
- Murphy, H. F.**, and Daniel, H. A. Some chemical and physical properties of normal and solonetz soils and their relation to erosion, 453-461.
- Nourse, E. G.**, et al. America's Capacity to Produce (book review), 486.
- Nowell, R. I.** See **Jesness, O. B.**
- Orcutt, F. S.**, and Wilson, P. W. Effect of nitrate-nitrogen on the carbohydrate metabolism of inoculated soybeans, 289-296.
- Parbery, N. H.** Mineral constituents in relation to chlorosis of orange leaves, 35-45.
- Pember, F. R.** See **Gilbert, B. E.**
- Perold, I. S.** See **DuToit, M. S.**
- Puri, A. N.** Ammonium carbonate method of dispersing soils for mechanical analysis, 263-270.
- Richards, E. H.**, and Shrikhande, J. G. Preferential utilization of different forms of inorganic nitrogen in the decomposition of plant materials, 1-8.
- Shaw, W. M.**, and MacIntire, W. H. Determination of absorbed bases by boiling with ammonium chloride and the utility of the procedure in related soil investigations, 359-375.
- Shive, J. W.** See **Arrington, L. B.**; **Arrington, L. B.**, **Wadleigh, C. H.**, and **Shrikhande, J. G.** See **Richards, E. H.**
- Smith, G. D.** See **Jenny, H.**
- Snow, L. M.** Comparative study of the bacterial flora of wind-blown soil: IV. Shackleford Bank, North Carolina, 227-231; V. Monterey Peninsula, California, 233-236.
- Sokolovskii, A. N.** Kurs Sel'skokhozyaistvennogo Pochvovedeniya (A Course in Agricultural Pedology) (book review), 403.
- Starkey, R. L.** Isolation of some bacteria which oxidize thiosulfate, 197-219.
- Sterges, A. J.** See **Fraps, G. S.**
- Swingle, D. B.** Plant Life. A Textbook of Botany (book review), 482.
- Theroux, F. R.** See **Eldridge, E. F.**
- Tyner, E. H.** Feeding power of plants for the potassium in feldspar, exchangeable form, and dilute solution, 405-423.
- Tyurin, I. V.** Kurs Pochvovedeniya (A Course in Pedology) (book review), 403.
- Wadleigh, C. H.** See **Arrington, L. B.**, and **Shive, J. W.**
- Wadsworth, H. A.** Note on the relationship between the chemical composition of soil colloids and two of their properties, 171-176.
- Walker, R. H.**, and Brown, P. E. Nomenclature of the cowpea group of root-nodule bacteria, 221-225.
- Warner, J. D.** See **Barnette, R. M.**
- Watson, J. A. S.** Rural Britain To-Day and To-Morrow (book review), 485.
- Wilson, P. W.** See **Orcutt, F. S.**
- Zetterberg, J. M.** See **Alway, F. J.**

## SUBJECT INDEX

- Alkalinity—
    - potential, of irrigation water, 447.
    - relation of, to phosphate availability, 443.
  - Aluminum—
    - base exchange compounds, preparation of, 476.
    - grasses and weeds, tolerance of, to toxic, 425-429.
    - silicates, cation exchange maximum in, 161.
    - soluble, in soils, 241.
    - solubility of, in ammonium chloride, 366.
    - toxicity of, to tobacco, 17.
  - America's Capacity to Produce (book review), 486.
  - Ammonia—
    - method of determining, in manure, 3.
    - oxidation of, as affected by sunlight, 88.
  - Ammonium—
    - absorption of, nitrogen by tomato seedlings, 431.
    - acetate extraction of colloids with, 470.
    - carbonate as dispersing agent, 263.
    - chloride, determination of absorbed bases with, 359.
    - ion, effect on solubility of phosphate, 350
  - Aso, Keijiro, a biographical sketch, 255.
  - Azotobacter, protein synthesis by, 327-336.
  - Bacteria—*see also* Microorganisms, Azotobacter.
    - characteristics of, belonging to the autochthonous microflora of the soil, 95-110.
  - globiforme—
    - ammonium salts utilization, 106.
    - sugar consumption by, 103.
  - in wind-blown soil, 227-236.
  - legume, carbohydrate requirement of, 128.
  - nomenclature of the cowpea group of root-nodule, 221-225.
  - thiosulfate oxidizing, isolation of, 197.
- Bacteriology, Bergey's Manual of Determinative (book review), 481.
- Base—
  - content of solonetz, 456.
  - exchange capacity—
    - and colloid composition, 174.
    - determination of, 373.
    - of bentonite and soil colloids, 467.
- Bases, replaceable—
  - as affected by grinding, 470.
  - determination with ammonium chloride, 359-375.
  - in Norfolk, Portsmouth, and Bladen soils, 249.
  - relation to intake of, by orange trees, 42.
- Bentonite—
  - colloids from, analyses, 471.
  - loss of water from, upon heating, 474.
- Biochemistry, Practical Methods in (book review), 480.
- Boron, effect on legume nodules, 133.
- Calcium—
  - effect on—
    - release of ammonia from ammonium chloride, 363.
    - solubility of phosphate in soils, 349.
  - replaceable—
    - in certain soils, 249.
    - relation to intake of, by orange trees, 43.
- Carbohydrates—
  - in plants, method of analysis, 301.
  - metabolism of, as affected by nitrates, 289.
  - supply of, and nodule formation, 123.
- Carbon dioxide—
  - an index for crop response to fertilizers, 47.
  - apparatus for the determination of, in culture solutions, 437.
  - as a growth limiting factor in semi-arid soils, 445.
  - nodules growing on plants with increased, 132.
- Cations—
  - effect on—
    - pan formation, 384.
    - phosphate fixation in soils, 349.
  - fixation of, by wetting and drying, 472.
- Chemistry—
  - Organic, A Textbook (book review), 479.
  - Organic, Perkin and Kipping's (book review), 479.
- Clays, colloidal, mineral constituents of, 463-478.

- Clover, red, composition of, 126.
- Colloidal clays, mineral constituents of, 463-478.
- Colloids—  
 amphoteric nature of, in coastal plain soils, 237-254.  
 analyses of purified, from nontronite and bentonite, 471.  
 chemical composition of soil, and its relation to two of their properties, 171-176.  
 differential flocculation of, 466.  
 exchange capacity and, 174.  
 moisture equivalent of, 171.
- Corn—  
 chlorosis, description of, 145.  
 germination of, after immersion in fertilizer materials, 179.  
 toxic influence of fluorine on germination of, 177-195.  
 zinc sulfate as a remedy against chlorosis in, 145-159.
- Culture solutions—  
 apparatus for flowing, 411.  
 apparatus for the determination of carbon dioxide in, 437-441.  
 for tomatoes, 431.  
 phosphate content of lemon cuttings grown in, 120.
- Electrodialysis, separation of mineral constituents by, 465.
- Europe, Economic Development in Modern (book review), 486.
- Feldspar, feeding power of plants for the potassium in, 405.
- Fertilizers—  
 carbon dioxide as an index of crop response to, 47.  
 effect of, on oat yields, 114.  
 fluorine in phosphatic, toxic influence on corn, 177.  
 phosphate, effect on yield and phosphorus pentoxide in plants, 285.  
 superphosphate, *see* Superphosphate.
- Fluorine, toxic influence of, on germination of corn, 177.
- Food Products, Beverages, Rubber, Tobacco, and Miscellaneous Manufactures Based on Vegetable Products (book review), 488.
- Geography, A Commercial and Economic (book review), 484.
- Grasses, tolerance of, to toxic aluminum, 425.
- Hydrofluoric acid, solubility of silicates in, 469.
- Hydrogen-ion concentration—  
 effect on—  
 leaching of organic matter, 253.  
 phosphate intake, 451.  
 levels of culture solutions for tomato seedlings, 431.  
 lime content and, in soils, 167.  
 relation to—  
 part per million of sodium carbonate, sodium hydroxide, and hydroxyl ions, 446.  
 soil-water ratio, 448.
- Humus—  
 effect of, on pan formation, 384.  
 water-soluble, in soils with a glei horizon, 393.
- Infusorial earth, fixation of phosphate by, 353.
- Iron—  
 extraction of free, oxide with sodium acid oxalate, 467.  
 silicates, cation exchange in, 163.  
 solubility of, in ammonium chloride, 366.
- Land, A Program for, Use in Northern Minnesota (book review), 484.
- Legume—*see* also Clover, Soybeans, etc.  
 nodules—  
 as affected by various factors, 297.  
 effect of boron on, 133.  
 of the cowpea group, 221.  
 of the soybean, 222.  
 relation of carbohydrates to location of, 129.  
 symbiosis, carbohydrate supply as primary factor in, 123-143.
- Legumes, chemical composition of, 126.
- Lemon cuttings, phosphate content of, 120.
- Lime, relation to hydrogen-ion concentration of soils, 167.
- Magnesium—  
 content of healthy and chlorotic orange leaves, 44.  
 effect on—  
 release of ammonia from ammonium chloride, 363.  
 solubility of phosphate in soils, 349.
- replaceable—  
 in certain soils, 249.  
 relation to intake of, by orange leaves, 43.

- Manganese, toxicity of, to tobacco, 15.
- Microorganisms—*see also* Organisms, Bacteria, Fungi.  
effect on soil conductivity, 62.  
response of, to nitrogen and nitrogen-phosphorus fertilizers, 51.  
sunlight, effect on, 92.
- Minerals, probable, as indicated by analyses, 474.
- Moisture equivalent, chemical composition and, of colloids, 171.
- Nitrate nitrogen—  
absorption of, by tomato seedlings, 431.  
effect on carbohydrate metabolism, 289–296.
- Nitrates—  
loss of nitrogen from, in artificial manure, 7.  
method of determining, in manure, 4.
- Nitrification, sunlight, effect on, of ammonium salts, 85–94.
- Nitrogen—  
compounds in *Azotobacter*, 330.  
content of orange leaves, relation to chlorosis, 44.  
effect on nodule formation, 135.  
fixation—  
carbohydrate supply and, 136.  
energy requirements for, 136.  
inorganic, utilization in the decomposition of plant materials, 1–8.  
loss of, in artificial manure, 7.  
method of determining, in plants, 301.  
nitrate—*see also* Nitrates, Nitrate nitrogen.  
absorption by tomato seedlings, 431.  
effect on carbohydrate metabolism, 289.
- Nontronite, colloids from, analyses, 471.
- Nutrient solution, *see* Culture solutions.
- Oats, phosphate distribution in, at heading stage, 117.
- Orange—  
leaves, mineral constituents in relation to chlorosis of, 35–45.  
root distribution of, trees in Australia, 36.
- Organic matter, leaching of, 253.
- Organisms, nitrifying, as affected by sunshine, 92.
- Oxygen as a factor in glei formation, 397.
- Peat, fixation of phosphate by, 353.
- Pedology—  
A Course in (book review), 403.
- Agricultural, A Course in (book review), 403.
- Permutite, fixation of phosphate by, 353.
- Phosphate—  
accumulation in green oats as affected by nitrogen deficiency, 116.  
availability—  
as measured by the inorganic phosphate in plants, 111–122.  
in calcareous soils, 443.  
fertilizers—  
a comparison of various kinds, 285.  
toxic influence of fluorine in, 177.  
fixation in soils, 337–358.  
solubility of—  
as affected by cations, 349.  
compounds, 443.
- Phosphorus—  
availability, 277.  
effect on manganese toxicity to tobacco, 18.  
fixation of, by soils, 249.  
penetration in soils, 277.
- Plant—  
growth—  
as affected by length of day and shading, 297–321.  
soil reaction and, 240.  
Life, A Textbook of Botany (book review), 482.  
materials, decomposition of, as affected by inorganic nitrogen, 1.  
sap—  
dialysis of, 417.  
hydrogen-ion concentration of the, 290.  
potassium in, 417.  
sucrose content of, 292.  
tissue, phosphate determination in, 111.
- Plants—  
aluminum toxicity to grass and weed, 425.  
analyses of tobacco, 20, 21.  
feeding power of, for potassium in feldspar, exchangeable form, and dilute solution, 405–423.  
manganese in tobacco, 20, 21.  
methods of analyses, 20.
- Potassium—  
concentration for best plant growth, 410.  
effect on—  
phosphate accumulation in green oats, 117.  
phosphate solubility, 349.

Potassium—(*continued*)

- in plant sap, 417.
- replaceable—
  - feeding power of plants for, 405.
  - in certain soils, 249.
  - relation to intake of, by orange leaves, 43.

Protein synthesis by *Azotobacter*, 327.

Pumice, fixation of phosphate by, 353.

Rothamsted Experimental Station Report for 1933 (book review), 488.

Root-nodule bacteria of the cowpea group, 221.

Roots, carbohydrate absorption through, 127.

Rural Britain To-Day and to-Morrow (book review), 485.

Sediments, A Study of the, of the North Baltic and Adjoining Seas (book review), 483.

Sericite, loss of water, by, upon heating, 474.

Sewage, A Laboratory Manual for the Chemical Analysis of Water and (book review), 480.

## Silica—

- effect on solubility of phosphate, 350.
- extraction of free, with sodium carbonate, 466.
- solubility of, in ammonium chloride, 366.

## Silicates—

- identification of iron, 471.
- magnesium, in bentonite, 475.
- solubility of, in hydrofluoric acid, 469.

Silviculture, The Theory and Practice of (book review), 482.

## Sodium—

- carbonate, effect on base exchange capacity of bentonite and a soil colloid, 467.
- effect on phosphate solubility in soils, 349.
- silicate, effect on phosphate fixation, 350.

## Soil—

- bacteria, *see* Bacteria.
- classification, 265.
- colloidal behavior, laws of, 75-84, 161-165.
- colloids, *see* Colloids.
- complex—
  - degradation and regeneration of the, 75.
  - isoelectric, synthesis and regeneration of the, 78.
- conductivity—
  - and fertility, 71.
  - method of determining, 60.

relation to dispersion, 70.

conductivity, as affected by—

- hydrolysis, 69.
- particle size, 66.

constituents, absorption of, by plants, 247.

erosion, relation to properties of solonetz, 453.

exchange complex, chemical nature of, 75.

fertility, conductivity as a measure of, 59.

International Congress of, Science, 324.

leachates, analyses of, in tobacco culture, 19.

mechanical analysis, method of, with ammonium chloride, 373.

microorganisms, *see* Microorganisms.

pan formation in, 377.

particles, fixation of phosphate by various sizes of, 347.

## profile—

- clay pan formation in the, 377.
- root distribution of orange trees, 36.
- solonetz and normal, 455.
- studies, 391-401.

reaction and plant growth, 240.

sampling instrument, 257-261.

Science, American Section of the International Society of, 323.

solution, alkalinity of, 445.

suspension, conductivity of, as a measure of fertility, 59-74.

wind-blown, a study of the bacterial flora of, 227-236.

zinc sulfate addition to the, against corn chlorosis, 145.

## Soils—

- Aiken clay, partial analysis, 339.
- alkali, in India, clay content of, 267.
- amphoteric nature of three Coastal Plain, 237-254.
- black cotton, in India, 266.
- Bladen, replaceable bases in, 249.
- calcareous, relation of potential alkalinity to the availability of phosphate in, 443-452.
- carbon dioxide production by, as a fertilizer index, 47-57.
- Clareville clay loam, some analyses, 86.
- Delhi sand, partial analysis, 339.
- Denham silt loam, cotton yield and hydrogen-ion concentration of, 51.
- dispersing, with ammonium carbonate, 263.

## Soils—(continued)

- dispersion coefficient of solonetz, 458.
- Fresno fine sandy loam, partial analysis, 339.
- glei process in, 391.
- Gold Ridge sandy loam, partial analysis, 339.
- Holland loam, partial analysis, 339.
- Houston black clay, some analyses, 86.
- Houston clay, cotton yield and hydrogen-ion concentration of, 51.
- humus, in India, 267.
- India, clay content of, 265.
- Kentucky, toxicity of manganese to tobacco in acid, 15-33.
- laterite, in India, 267.
- mechanical analysis of, method, 263, 271.
- Memphis silt loam, cotton yield and hydrogen-ion concentration of, 51.
- Minnesota, calcium carbonate and magnesium carbonate in, 9-14.
- nitrification in, *see* Nitrification.
- Nord sandy loam, partial analysis, 339.
- Norfolk fine sandy loam, cotton yield and hydrogen-ion concentration of, 51.
- Norfolk, replaceable bases, in, 249.
- North, South Atlantic and Pacific, a comparison, 230.
- Okitbheha clay, cotton yield and hydrogen-ion concentration of, 51.
- Orangeburg fine sandy loam, cotton yield and hydrogen-ion concentration of, 51.
- pan formation in, effect of electrolytes on, 381.
- phosphorus, *see* Phosphorus, Phosphate.
- podzol—
  - analysis of glei, 396, 400.
  - association with glei formation, 392.
- Portsmouth, replaceable bases in, 249.
- Ramona loam, partial analysis, 339.
- relation to lime content and pH values of, 167-169.
- Ruston fine sandy loam, cotton yield and hydrogen-ion concentration of, 51.
- Sarpy fine sandy loam, cotton yield and hydrogen-ion concentration of, 51.
- Shamrock very fine sandy loam, some analyses, 86.
- solonetz, chemical and physical properties of, 453-461.
- sunlight effects on nitrification in, 85.
- Trinity clay, cotton yield and hydrogen-ion concentration of, 51.
- Victoria fine sandy loam, some analyses, 86.
- Vina clay loam, partial analysis, 339.
- Vina silt loam, partial analysis, 339.
- Yohola very fine sandy loam, cotton yield and hydrogen-ion concentration of, 51.
- Yolo silt clay loam, partial analysis, 339.
- Soybeans—
  - carbohydrate metabolism of, as affected by nitrates, 289.
  - composition of, 126, 297.
  - factors influencing growth of, 297-321.
- Straw—
  - oat, effect of inorganic nitrogen on decomposition, 5.
  - wheat, effect of ammonium nitrate on decomposition, 3.
- Superphosphate, toxicity of, to germination of corn, 178, 183.
- Talc—
  - fixation of phosphate by, 353.
  - in bentonite, 475.
- Thiosulfate, oxidation of, by bacteria, 197-219.
- Tobacco—
  - as affected by aluminum in water cultures, 17.
  - manganese toxicity to, 15.
- Tomato seedlings, absorption of ammonium and nitrate from culture solution by, 431-435.
- Town and City Planning, Outline of (book review), 487.
- Ultra-violet microphotographs, use of, in study of colloids, 473.
- Vetch, influence of sugars on growth of, 128.
- Water—
  - and Sewage, A Laboratory Manual for the Chemical Analysis of (book review), 480.
  - irrigation—
    - absorption of phosphate by plants as affected by, 451.
    - potential alkalinity of, 447.
- Weeds, tolerance of, to toxic aluminum, 425.
- Zinc sulfate, response of chlorotic corn plants to the application of, 145.